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PRIORITY AREAS OF FERROALLOYS PRODUCTION

İn the production of ferroalloys, one of the major costs is the cost of raw materials. Both from an economic point of view, as well as an environmental point of view, full optimization of the raw materials is desired. İn this regard, it is very importand to choose the right production technology. The methods used in the production of ferroallays depend on the type of reducer.

The article substantiates the growing role of ferroalloy production in the conditions of the formation of the modern stage of economic development neo- industrial analysis. The main trends in the development of ferroalloy production are identified, with the emphasis on the increasing concentration of production and the growth in consumption of ferroalloys, the special role of the mineral resource base as a factor.

The distinguishing feature of the modern stage of economic development requires a reconsideration of conceptual relations in the assessment of industrial potential formed in the second half of the twentieth century.

The current situation in the world is characterized by the presence of noncompetitive industries, low innovative activity and the rapid development of problems in the high-tech sector. In the context of modern global challenges, the search for new development factors and experience is characterized by the most effective use of competitive advantages in the world as a whole, as well as in individual regions.

On the eve of the industrial revolution that started in the 18^{th} century, the development of mechanical engineering and other branches of heavy industry necessitated the development of the metallurgical industry. Since then, it has been known that industrial labor in the entire economy determines the increased rate of production [1].

Since the basis of the economy in our country is industry, great importance is attached to the development of this sector, especially the non-oil sector. One of the most important areas of economic activity in the non –oil sector is to increase the production of metal products, including ferroalloys, alloy steels and non-ferrous metal alloys, and meet the growing needs of the industry.

Ferroalloys are of particular importance for the production of ligatures, high-strength, high strength modified steels. Such steels stimulate the development of the most important areas of industrial production. It is essential for the manufacture of heavy-duty parts needed in the engineering, aerospace, defense and other industries. The need to meet high technical requirements for the structure and properties of metals and alloys requires the expansion of existing research and the development of new technologies for the production of metals and alloys.

The development of the metallurgical industry has led to the formation of iron and silicon wastes, which are widely used in this field. Therefore, in-depth scientific research is necessary to create technological properties.

The main raw materials for materials for the production of ferroalloys are ores or concentrates. The higher oxide content of the elements contained in the ore is used. Ferrotungsten, ferromolybdenum, ferrovanadium in the manufacture of alloys, high oxide element content enriches less mass and lower concentration [2].

Ferroalloys can be obtained by reducing the oxides of the corresponding metals. To obtain any alloy, it is necessary to select the appropriate lead element and create conditions for the processing of high- productivity raw materials. The lead element must be a more oxygen resistant chemical that the element that must be obtained from the oxide.

In other words, the precursor element must from a chemically stronger oxide. The process of oxide recovery is more effective if it occurs in the presence of iron or its oxides. Oxidation of the main element reduces the activation of iron and prevents further oxidation [3].

Analysis of the state of ferroalloy production in the world allows the following trends to emerge:

- Continuous increase in the volume and consumption of ferroalloys;
- Studies aimed at meeting the needs of the needs of the internal market;
- Reduction of raw material resources;
- Increasing the role of metallurgical technologies;
- Development of cooperation and integration processes;
- Creation of new production enterprises on the basis of industrial parks.

At present, a comparative analysis of various technological schemes of ferroalloy production has been carried out. This comparative analysis shows that slag and sludge produced by ferroalloys are important as raw materials in metallurgy. Therefore, of particular interest to metallurgy is ferroalloy slag. They contain a significant amount of valuable components used for purification and doping of iron-carbon alloys.

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FORMATION OF MOLYBDENE COATINGS ON STEEL IN CONDITIONS OF SELF PROPAGATING HIGH TEMPERATURE SYNTHESIS

A promising way to obtain coatings with adjustable composition, structure and performance characteristics with limited or minimal time of their formation is the strengthening of steels with molybdenum coatings obtained in the conditions of self-propagating high-temperature synthesis (SHS). For the deposition of coatings, we used steels of mass purpose (st.20, st.45, U8). The treatment was carried out in open-type reactors in the thermal autoignition mode. Working temperature range 1000 ÷ 1300 ºC, duration of isothermal holding - 120 min. Powders of oxides of chromium and aluminum, titanium, chromium, aluminum, technical purity, metallic iodine with a dispersion of 200-350 microns were used as reaction agents.

Characteristically, in the temperature range of 800–1600 K, the reaction products decompose during molybdenum, which is confirmed by the production of decomposition substances and a sharp increase in the number of gas moles. With increasing temperature there is an increase in the number of aluminum halides: AlH_3, AlCl, $AlCl_2$, $AlCl_3$, Al_2Cl_6, AlI, AlI_2, AlI_3 chromium: CrCl, $CrCl_2$, $CrCl_3$, CrI, CrI_2, molybdenum: MoCl, $MoCl_2$, MoI, MoI_2, MoI_3.During molybdenization of iron-carbon alloys under similar conditions, the surface zone of the samples was decarburized and the diffusion layer was a solid solution of molybdenum in α-iron. At saturation of steels of mass use in powder mixtures based on molybdenum and ferromolybdenum at 1100-1150 ° C for 2 h, a diffusion layer is formed from a solid solution of molybdenum in α-iron (a-phase).

The thickness of the diffusion layer obtained at 1050 ° C is about 150 μm. An increase in temperature to 1150-1300 ° C leads (with slow cooling) to the formation of inclusions of the intermetallic Fe_7Mo_6 in the α-phase.